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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/557,423	04/21/2000	Boris P. Belotserkovskii	A-68112-1/RFT/RMS/DSS	6773

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EXAMINER

LOEB, BRONWEN

ART UNIT

PAPER NUMBER

1636

DATE MAILED: 06/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/557,423

Applicant(s)

BELOTSEKOVSKII ET AL.

Examiner

Bronwen M. Loeb

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 43-45,52-66,108,112 and 113 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 43-45,52-66,108,112 and 113 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### **DETAILED ACTION**

The request filed on 3 April 2002 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/557,423 is acceptable and a CPA has been established. An action on the CPA follows.

The amendment filed 3 April 2002, in which claims 1-5, 7-26, 28-42, 46, 47 and 49-51 were deleted, amended claims 43-45 and 52-54 were amended and new claim 113 was added, has been entered.

Claims 43-45, 52-66, 108, 112 and 113 are pending.

### ***Response to Amendment***

1. The rejection of claims 18-21 and 39-42 under 35 USC §112, second paragraph as being indefinite has been withdrawn in view of Applicant's amendment.

The rejection of claims 1, 8, 9-22, 29-42, 50 and 51 under 35 U.S.C. §102(e) as being anticipated by Pati et al (USP 5,948,653) has been withdrawn in view of Applicant's amendment.

The rejection of claims 1, 7, 12-14, 18-22, 30, 33-35, 39-42 under 35 U.S.C. §102(b) as being anticipated by Sena et al (USP 5,273,881) has been withdrawn in view of Applicant's amendment.

The rejection of claims 1-3, 8, 9-24, 29-42, 50 and 51 under 35 U.S.C. §103(a) as being unpatentable over Pati et al as applied to claims 1, 8, 9-22, 29-42, 50 and 51 above, and further in view of Helene et al (Biochimica et Biophysica Acta (1990) 1049:99-125) has been withdrawn in view of Applicant's amendment.

The rejection of claims 1, 5, 7, 8, 9-21, 22, 26, 28-42 and 48-51 under 35 U.S.C. §103(a) as being unpatentable over Pati et al as applied to claims 1, 8, 9-22, 29-42, 50 and 51 above, and further in view of Barton (USP 5,225,556) has been withdrawn in view of Applicant's amendment.

The rejection of claims 1, 4, 8, 9-21, 22, 25, 29-42, 46, 50 and 51 under 35 U.S.C. §103(a) as being unpatentable over Pati et al as applied to claim claims 1, 8, 9-21, 22, 29-42, 50 and 51 above, and further in view of Simonsson et al (Nucleic Acids Research (1998) 26:1167-1172) has been withdrawn in view of Applicant's amendment.

2. Claims 60-63 stand rejected under 35 USC §112, second paragraph as being indefinite for the reasons of record and as further discussed below.

Claims 43, 52-66 and 108, and new claim 113, stand rejected under 35 U.S.C. §102(e) as being anticipated by Pati et al (USP 5,948,653).

Claims 43, 52-66, 108, 112 and new claim 113, stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pati et al.

Claims 43, 45, 52-66, 108, 112 and new claim 113, stand rejected under 35 U.S.C. 103(a) as being unpatentable over Pati et al as applied to claims 43, 52-66, 108, 112 and 113 above, and further in view of Helene et al (Biochimica et Biophysica Acta (1990) 1049:99-125).

Claims 43, 45, 52-66, 108, 112 and 113 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pati et al as applied to claims 43, 52-66, 108, 112 and 113 above, and further in view of Barton (USP 5,225,556).

Claims 43, 45, 52-66, 108, 112 and 113 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pati et al as applied to claim claims 43, 52-66, 108, 112 and 113 above, and further in view of Simonsson et al (Nucleic Acids Research (1998) 26:1167-1172).

3. New grounds of rejection are presented below.

***Response to Arguments***

4. With regard to the rejection of claims 60-63 under 35 USC §112, second paragraph as being indefinite, Applicant's argument has been fully considered but is deemed not persuasive.

Applicant has deleted numerous claims and amended others however claim 60 is still vague and indefinite as there is no antecedent basis for the phrase "said single stranded nucleic acids". Note that the parent claim 43 recites "a single stranded targeting polynucleotide" which is singular and has the phrase "targeting polynucleotide" in it.

5. With regard to the rejection of: claims 43, 52-66 and 108, and new claim 113, under 35 U.S.C. §102(e) as being anticipated by Pati et al (USP 5,948,653); claims 43, 52-66, 108, 112 and new claim 113, under 35 U.S.C. §103(a) as being unpatentable over Pati et al; claims 43, 45, 52-66, 108, 112 and new claim 113, under 35 U.S.C. §103(a) as being unpatentable over Pati et al as applied to claims 43, 52-66, 108, 112 and 113 above, and further in view of Helene et al (Biochimica et Biophysica Acta (1990) 1049:99-125); claims 43, 45, 52-66, 108, 112 and 113 under 35

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U.S.C. §103(a) as being unpatentable over Pati et al as applied to claims 43, 52-66, 108, 112 and 113 above, and further in view of Barton (USP 5,225,556); and claims 43, 45, 52-66, 108, 112 and 113 under 35 U.S.C. §103(a) as being unpatentable over Pati et al as applied to claims 43, 52-66, 108, 112 and 113 above, and further in view of Simonsson et al (Nucleic Acids Research (1998) 26:1167-1172), Applicant's argument has been fully considered but is deemed not persuasive.

Applicant has amended claim 43 to recite "substantially complementary". This amendment does not remove the anticipatory nature of Pati et al as a reference. As discussed in detail in the action mailed 17 January 2001, Pati et al teach a composition comprising at least one recombinase and a double D-loop comprising a target nucleic acid and two substantially complementary single stranded targeting polynucleotides, each of which contains a) two homology clamps substantially complementary to the preselected target nucleic acid and b) at least one locking sequence. See col. 19, line 61-col. 20, line 3, col. 22, lines 31-59, Figures 10, 13B, and 13C, and ex.5, col. 53-58, wherein the "locking sequence" in the instant specification reads on the "internal homology clamp" of Pati et al and wherein Figure 13B, for instance, illustrates a single stranded targeting polynucleotide comprising a first and second homology clamp and at least one anchoring sequence. The composition wherein the nucleic acids may be DNA, RNA or a hybrid of both is taught in col. 16, lines 19-30. The composition wherein the recombinase is a prokaryotic recombinase is taught in col. 23, line 35- col. 24, line 8 and wherein the recombinase is prokaryotic RecA protein and wherein the RecA is from E. coli is taught in col. 24, lines 8-15. The composition wherein the recombinase is an

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eukaryotic recombinase is taught in col. 24, lines 15-20 and wherein it is Rad51 is taught in col. 24, lines 19 and 30. The composition wherein the eukaryotic recombinase is a complex of recombinase proteins is taught in col. 24, lines 22-23. The composition where at least one single stranded nucleic acid contains at least one substituent is taught in col. 7, lines 17-29 and col. 27, lines 40-42. The composition wherein the substituent is a chemical substituent is taught in col. 27, line 40- col. 28, line 5 and wherein the substituent is a protein is taught in col. 27, lines 58-59 and 65. The composition wherein the substituent is selected from the group consisting of intercalators, cross-linking moieties, labels, photoactive moieties, nucleic acid scission inducing moieties, purification moieties and nucleic acid modification moieties is taught in col. 27, lines 40-col. 28, lines 24. A cell containing the composition is taught in col. 28, lines 65-67, wherein the cell is eukaryotic is taught in col. 29, lines 63-65 and wherein it is prokaryotic is taught in col. 29, line 28. A kit comprising at least one recombinase and two substantially complementary single stranded targeting polynucleotides, each containing at least one homology clamp and at least one locking sequence is taught in col. 35, lines 58-59.

Since the primary reference, Pati et al, in all of the rejections under 35 USC §103(a) is not deficient in any way, the rejections under 35 USC §103(a) are all maintained for reasons of record (see particularly the action mailed 17 January 2001). For clarification, it is noted that the rejections based on Pati et al in view of Helene et al, Barton or Simonsson et al are applied to different embodiments of claim 45.

**New Grounds of Rejection**

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. §112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 44 and 64-66 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 44 is vague and indefinite as it is unclear what the recitation, "to at least one of forms a lock structure with said locking sequence", means. Due to this confusion, claim 44 has not been further treated on the merits.

Claim 64 is vague and indefinite as it is dependent, in part, on cancelled claims. Therefore, the metes and bounds of the claim cannot be determined.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. §102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 43, 52, 54-56, 60-63, 108 and 113 are rejected under 35 U.S.C. §102(b) as being anticipated by Sena et al (USP 5,273,881). Sena et al teach a composition comprising at least one recombinase and two substantially complementary single



stranded targeting polynucleotides, each containing a) two homology clamps that are substantially complementary to a preselected target nucleic acid sequences and b) at least one locking sequence. See Figure 9G, col. 3, lines 44-53, and col. 4, lines 1-8 wherein the "locking sequence" of the instant invention reads on the complementary end terminal extensions taught by Sena et al. The composition wherein the recombinase is a prokaryotic recombinase is taught in col. 7, lines 27-46 and wherein the recombinase is prokaryotic RecA protein and wherein the RecA is from *E. coli* is taught in col. 7, lines 36-49. The composition where at least one single stranded nucleic acid contains at least one substituent is taught in col. 4, lines 16-21 and col. 5, lines 53-55. The composition wherein the substituent is a chemical substituent is taught in col. 5, lines 57-60 and wherein the substituent is a protein is taught in col. 5, lines 57-60. The composition wherein the substituent is selected from the group consisting of labels, photoactive moieties, nucleic acid scission inducing moieties, and purification moieties is taught in col. 4, lines 31-46 and col. 5, lines 53-60. A kit is a convenient assembly of components for a method. A lab, such as that of Sena et al, containing such components anticipates a kit.

### **Conclusion**

Claims 43-45, 52-66, 108, 112 and 113 are rejected.

Certain papers related to this application may be submitted to Art Unit 1636 by facsimile transmission. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 C.F.R. § 1.6(d)). The official fax telephone numbers for the Group are (703) 308-4242 and (703) 305-3014. NOTE: If Applicant does submit a

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paper by fax, the original signed copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED so as to avoid the processing of duplicate papers in the Office.

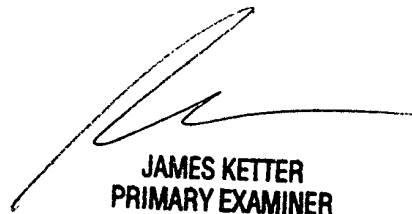
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bronwen M. Loeb whose telephone number is (703) 605-1197. The examiner can normally be reached on Monday through Friday, from 10:00 AM to 6:30 PM. A phone message left at this number will be responded to as soon as possible (usually no later than the next business day after receipt by the examiner).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Remy Yucel, can be reached on (703) 305-1998.

Any inquiry of a general nature or relating to the status of this application should be directed to Tracey Johnson, Patent Analyst whose telephone number is (703) 305-2982.

Bronwen M. Loeb, Ph.D.  
Patent Examiner  
Art Unit 1636

June 14, 2002



JAMES KETTER  
PRIMARY EXAMINER